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CIVITAS PORTIS TRANSFERABILITY

INSIGHTS INTO THE IMPLEMENTATION OF SMART MOBILITY MEASURES

TRIESTE MOBILITY MEASURE

COORDINATING FREIGHT MOVEMENTS &
REGULATING ACCESS TO THE PORT AREA



A publication by the CIVITAS PORTIS consortium

MOBILITY MEASURE COORDINATING FREIGHT MOVEMENTS & REGULATING ACCESS TO THE PORT AREA

WHAT IS IT ABOUT?

The port of Trieste is currently one of the top 10 freight ports within the European Union. Its geographic position, natural deep sea floor, intermodal and railway links, and special free zone status make the port particularly attractive to investors. Historically being built around the city, the city moved along with the more recent extension of the port. Due to the port being so close to the city, it is important to manage freight movements and congestion to minimise the impact of congestion within the immediate surroundings of the port, while at the same time maintaining the competitiveness of the port which is essential both for the regional as well as for the European economy.

To this end, Trieste Port Authority developed and realised a traffic data exchange system, named 'PORT InSight', to track & trace the accesses of vehicles and containers from the port gates to the terminal gates and vice versa. This new system upgrades the data and IT systems available to the control room of the Port of Trieste and enhances the management of traffic congestion which also has an impact on the City of Trieste, in order to reduce congestion, improve safety and allow for a better management of potential emergencies.

KEY ELEMENTS

Coordinating freight movements by:

- Implementing an efficient system of traffic data monitoring exchange;
- Increasing the coordination of freight movement activities in the port and outside the port;
- Reducing traffic congestion and increased freight transport efficiency.

Regulating access to the port area:

- Traffic control by monitoring the port terminals gates through the development of an automated gate data exchange system related to vehicles and containers entering/exiting port terminals;
- Development of an automated gate data exchange system;
- Design, implementation and development of an interoperability mechanism with the private terminals access systems, using a unified standard and to be connected and managed by the control room;
- Monitoring the 'remote access' to Trieste city and port along motorways getting to Trieste port through the control room. This was fostered by synergies with other European projects and initiatives.

This set of actions will lead to the reduction of congestion, improvement of safety, a better management of emergencies, and the improved management of port spaces.



TRIESTE PORT AUTHORITY DEVELOPED AND REALISED A TRAFFIC DATA EXCHANGE SYSTEM, NAMED 'PORT INSIGHT'

CONTEXT & CHALLENGES

The rationale for the implementation of this measure is ensuring a digital infrastructure supporting smooth operations and traffic control within the port areas, as well as improved traffic data exchange with the external areas. The automated solution envisaged allows to gather relevant information related to freight traffic accessing and exiting the terminals, the port area, and, consequently, affecting the transport network at both local and regional level.

Furthermore, it is further enhancing the already existing ICT control system regulating the access to the port areas from the wide territory, i.e. the motorways traffic getting to the port terminals. The planned improvements will allow increasing coordination and cooperation between the Port Authority and the port terminals as well as between the Port Authority and the city authorities.

The measures are implemented in the context of a broader Port network vision and in synergy with other EU projects.

Coordination of road traffic directed to the port of Trieste:

- The port of Trieste focuses on having a specific know-how on the movement of vehicles on the road.
- Customs as well as logistics data are to managed in a unique platform (Port Community System - PCS Sinfomar).
- It is strategic to monitor the traffic flows not only in the final part of the journey when trucks are already approaching the port gates.
- This approach has a strong impact on the management of traffic flows, congestions and utilization of public



MAIN ACTIVITIES

The implementation of this measure was realized in two stages:

Coordination of freight movements

In order to increase the coordination of freight movement activities within the port and outside the port areas, the port of Trieste implemented an efficient system of traffic data exchange and traffic control. The control room is equipped and prepared to be ready to receive and manage additional data concerning the monitoring of terminals' entering and exiting points inside the port. The improved co-ordination will reduce congestion and associated delays, thereby reducing related negative economic impacts and increasing freight transport efficiencies. To this end, a domotic centre has been designed and upgraded. Besides that, a number of ALPR-cameras and alarm devices were mounted in the Port area and the capillary optic fibre network has been realised. This stage encompassed the following actions:

- Installation of ALPR (Automatic Plate Licence Recognition) cameras to collect data concerning accesses to terminal gates;
- Realisation of a new software solution dedicated to the control room of the Port of Trieste;
- The web application PORT InSight allowing the management of vehicles foresees dedicated functionalities for the control room, such as:
 - a customised interface, with a specific view, updated in real-time;
 - tools to analyse data in the database, to aggregate data and to export reports;
 - eased research functionalities.

Regulating access to the port area

The implementation of the domotic centre supported the development of an automated system exchanging data related to vehicles or goods entering or exiting the port terminals. In this step, we focused on traffic control by monitoring the port terminal gates. The systematic traffic data exchange among terminals and the Port Authority collects data in real-time on vehicles entering/exiting terminals, the number of vehicles located in the

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area between the port gates and the terminal gates and the quantity of vehicles entering the city. The final goal is establishing a strong and permanent coordination among the Port Authority, the Municipality, and the other public entities in order to reduce congestion, improve road safety and allow a better management of emergencies.

In particular, this phase is encompassing two main actions:

- The design, implementation and development of an interoperability mechanism with the private terminals' access systems and of a transit closure system - the mechanism will use a unified standard and will be connected and managed by the control room;
- Monitoring of the 'remote access' to Trieste city and port through vehicle plates capturing video cameras installed along the motorway leading to the Port of Trieste (e.g. Ferneti and Tarvisio) by establishing an agreement with private motorways companies.

This action will be implemented also thanks to synergies with other European projects and initiatives. The monitoring will be connected and managed by the control room.

Main characteristics of the solution that has been realised

- Allows for data collection and analysis to track and trace the entrances and exits from and to terminal and port gates to realise the interoperability between systems in use.
- Example of the collected and stored data in Port In-Sight:
 - Area (terminal or port area)
 - Gate and Detection lane
 - Direction: flag i/o (in/out)
 - Detection date and time
 - Vehicle type (complete truck, trailer, semitrailer, fifth wheel, ...)
 - Plate number of the trailer and semitrailer
 - Container number and type or ILU number (in case of semitrailer)
- Utilisation of public and open data/metadata format;
- Utilisation of open interfaces that are public, documented and free to be extended;
- Utilisation of interoperability standards and cooperation protocols;



- Conformity to the EU Regulation (UE) 2016/679 – General Data Protection Regulation, GDPR, for the protection of personal data.

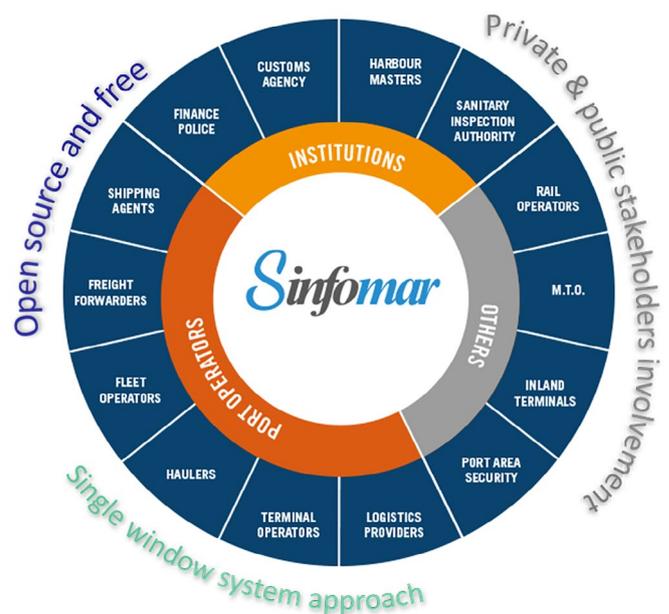


Figure 1: The Port Community System, PCS, of the Port of Trieste

THE FINAL GOAL IS ESTABLISHING A STRONG AND PERMANENT COORDINATION AMONG THE PORT AUTHORITY, THE MUNICIPALITY, AND THE OTHER PUBLIC ENTITIES IN ORDER TO REDUCE CONGESTION, IMPROVE ROAD SAFETY AND ALLOW A BETTER MANAGEMENT OF EMERGENCIES.

BENEFITS & COSTS

Benefits

The improved coordination can reduce congestion, hindering problems, their economic negative impacts and increase freight transport efficiencies. The following benefits are envisaged:

At Port level:

- Collection of enhanced data about traffic flows entering and exiting the port terminals
- Punctual and real time tracking of the vehicles and cargos inside the port areas to better manage port spaces, terminal occupancy
- Monitoring of port congestion, wasted time in port operations and energy consumption
- Reduction of congestion, improvement of safety and a better management of emergencies in port areas

At Port-City system level:

- Increased coordination of freight movement activities outside the port
- Reduction of traffic congestions and increased freight transport efficiencies
- Punctual knowledge of vehicles and containers entering/exiting terminals, in the area between the port gates and the terminal gates and entering the city
- Monitoring of impact on city congestion, air quality, and average vehicle occupancy

This leads to beneficial impacts in the following domains:

Economic

The forecasted growth of transport efficiency in the freight circulation inside the port area has the potential of contributing to economic growth because the controls related to transport are executed quicker and simpler and the port becomes more efficient and competitive.

Transport/Logistics

The implemented system will allow a punctual and real time tracking of the vehicles and cargos inside the port areas to better manage port spaces, terminal occupancy and implement security and safety measures. This will also allow

a better management of port spaces and the enhancement of freight transport efficiencies with the optimization of the whole process.

Safety and Security:

One impact of the measure – if combined with an on-purpose port Authority decree - is to remove parked trucks from the roads of the port areas and consequently remove congestion and allow for better and safer transport activities. The measure will also increase security because video-cameras and surveillance and alarm devices will be installed in the riskiest places of the port area.

Terminal check points will increase gate monitoring capacity, which means increased safety and security within the port area and consequently also in urban areas, as many areas of the port are strongly connected to the city.

Society:

The impact of the implementation of these measures are not only related to the port environment, but it will have important effects on the mobility of the City of Trieste, situated very close to the port gates. This will improve the management integration between port and urban areas by considering the two realities as closely interlinked.

Environment:

An enhanced level of coordination of transport movements inside and outside the port area will reduce traffic and congestion and will therefore have relevant effects on the reduction of environmental impact.

Costs

Costs are mainly related to the development of interoperability between IT systems of the involved port terminals and the control room of the Port Authority. Additionally, OCR (Optical Character Recognition) cameras are installed to support the implementation of the measures. The total costs of such actions were about € 150,000.

Moreover, technical and administrative employees of Trieste Port Authority are involved in the definition and design of the scenario, preparation of the tender for the implementation of both measures and verification of the status of implementation of the action.



TARGET GROUPS & STAKEHOLDERS

The port's activities within PORTIS were drafted following the feedback of the following stakeholders:

- Port Operators
- Truck drivers
- Port operators
- Terminal operators
- Customs agency
- Prefecture
- Trieste Municipality (COM TS): Local coordinator of the Portis activities; frequent interactions with city and port on the progress of the measure's implementation; with specific attention to the innovation aspects and communication to the residents in the immediate area of the port and Trieste's residents in general.
- AREA Science Park (AREA): Leader of the communications activities
- University of Trieste – (DIA): Evaluation partner – provided feedback

FROM CONCEPT TO REALITY

Preparation

The preparational phase took 24 months. The most important aspect of this phase was the definition of IT systems which were in use and the actual needs of terminal operators:

- Design of the domotic centre.
- Design of the software solution called PORT InSight and design of the interoperability mechanism with the Port Community System Sinfomar, with ViGate (gateway access control) and with port terminals' proprietary systems.

Lesson learned:

At port level, a punctual and real time tracking of the vehicles and containers inside the port areas allows a better management of port spaces and terminal occupancy. This also has impact on port congestion, wasted time in port operations and energy consumption.

At Port-City system level, the enhancement of coordination of freight movement activities outside the port has direct impact on reduction of traffic congestion and increase freight transport efficiencies and allows the full monitoring of vehicles and containers entering/exiting terminals, in the area between the port gates and the terminal gates and entering the city.

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Implementation

The implementation phase took 12 months. Key stages of the implementation process are:

- Preparation of a tender procedure
- Draft of the technical administrative documentation
- Development and implementation of functional, non-functional, security and interoperability requirements
- Involvement of operators in the implementation of the foreseen actions
- Implementation of the PORT InSight Software solution
- Creation of the web application platform (authentication functions, administration, management of users, profiles, domotic center and logistic areas)

Barriers:

Having access to data and information by interoperability mechanisms with IT system currently in use; hence the importance of involving the terminal operators in advance.

Drivers:

Meetings and on-site visits with the Ro-Ro terminal (Trieste Intermodal Maritime Terminal - TIMT) and the container terminal (Trieste Marine Terminal - TMT) to share the PORTIS objectives and on-going activities of Trieste Port Authority have been important to drive the implementation forward. The layouts of the installations of the OCR cameras are analyzed and approved by the terminals in order to proceed with the installations and to minimize any risks.



Operation

The system is fully operational since end of August 2020. Further enhancements to the system are foreseen, such as the ability to detect not only vehicles, but also passengers.

IS THIS SOMETHING FOR US?

Compared to the implementation of infrastructural measures, an ICT integration requires relatively low financial investments and can be realised within a short and medium-term time frame. Collaboration with the main terminal operators is essential in defining such measures and their factual implementation. Furthermore, it is important to focus on the overall Port and City Community.

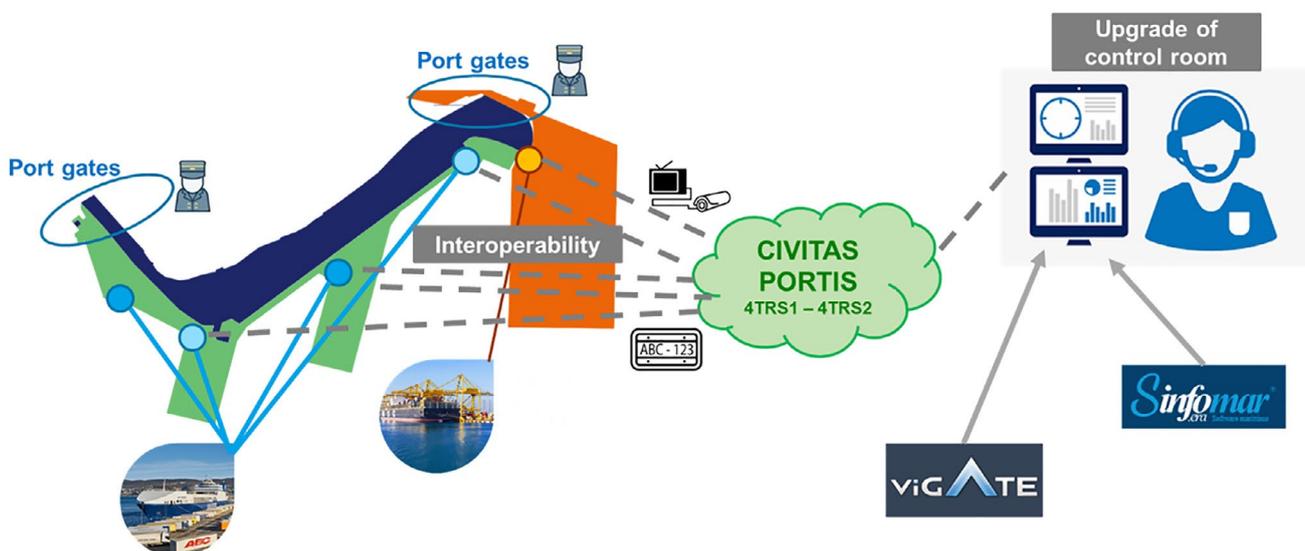


Figure 2: Implementation Highlights in Trieste

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PARTNERSHIP



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